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动物分类学报

DESCRIPTION ON A NEW *PHILOPONELLA* SPECIES (ARANEAE, ULOBORIDAE), THE FIRST RECORD OF SOCIAL SPIDERS FROM CHINA

LIN Yu-Cheng[1, 2], LI Shu-Qiang[1*]
1. *Institute of Zoology, Chinese Academy of Sciences, Beijing* 100101, *China*
2. *Graduate University of Chinese Academy of Science, Beijing* 100039, *China*

Abstract A new species of the family Uloboridae, *Philoponella alata* sp. nov., from Xishuangbanna tropical rainforest of Yunnan Province is described and illustrated. Type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS).

Key words *Philoponella*, morphology, social spiders, new species, China.

1 Introduction

Most spiders are solitary creatures, and social behavior is only known in a few dozen species (Buskerk, 1981; D'Andrea, 1987). Four categories of social behavior have been described for spiders: non-territorial permanent-social, territorial permanent-social, non-territorial periodic-social and territorial periodic-social (Avilés, 1997).

Several *Philoponella* species are well known territorial permanent-social spiders (Avilés, 1997; Masumoto, 1998). A total of seven *Philoponella* species are reported from China (Platnick, 2007): *P. cymbiformis* Xie *et al*., 1997, *P. lingulata* Dong, Zhu & Yoshida, 2005, *P. nasuta* (Thorell, 1895), *P. nigromaculata* Yoshida, 1992, *P. pisiformis* Dong, Zhu & Yoshida, 2005, *P. prominens* (Bösenberg & Strand, 1906) and *P. wuyiensis* Xie *et al*., 1997. However, none of them are reported to have social behavior. In the current paper, a new *Philoponella* spider is reported from the Xishuangbanna rainforest of Yunnan Province in southwestern China and its social behavior is characterized. This rainforest is one of the richest regions in biodiversity in China and was named biodiversity conservation centre in the world.

2 Material and Methods

Specimens were examined using an SZX12-Olympus stereomicroscope and illustrated using an Olympus-BX51 compound microscope equipped with a drawing tube. After being separated from the body, male palps and female epigyna were illustrated. Embolic divisions were dissected from the male palpal bulb using sharp pins and forceps. Vulvae of female were cleared in lactic acid.

Measurements are given in millimeters. Leg measurements are shown as: total length (femur, patella, tibia, metatarsus, tarsus). Terms used in the text and figure legends follow mainly Opell (1979) and partly Yoshida (1992). Abbreviations used in text and figures are: ALE-anterior lateral eye; AME-anterior median eye; C-conductor; E-embolus; FD-fertilization duct; MAB-median apophysis bulb; MAS-median apophysis spur; PLE-posterior lateral eye; PME-posterior median eye; S-spermatheca.

All type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing (IZCAS). Photos of the type specimens of the species included in this paper can be viewed from website http://www.ChineseSpecies.com which was created and maintained by LI Shu-Qiang and WANG Xin-Ping (Li & Wang, 2007).

3 Taxonomy

Philoponella **Mello-Leitão, 1917**

Philoponella alata **sp. nov.** (Figs. 1-9)

Type material. Male holotype from Xishuangbanna tropical rainforest (21.5° N, 101.2° E; alt. 569 m), Yunnan Province, China, 24 Dec. 2006, collected by LI Shu-Qiang. Paratypes: 32 males and 2 females, same collection data.

Other material studied. 140 larvae, same collection data.

Etymology. Specific epithet of *P. alata* sp. nov. derived from the Latin *alataus* (wing), referring to the wing-shaped basal lobe of conductor of male palp; adjective.

Diagnosis. *P. alata* sp. nov. is similar to *P. vittata* (Keyserling, 1881) but can be distinguished by having a wing-shaped conductor basal lobe in male and by the different shapes of crypt opening and fertilization duct in female.

Description. Male (holotype). Total length 4.25. Carapace 1.65 long, 1.40 wide. Sternum 0.95 long,

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* Corresponding author, E-mail: lisq@ioz.ac.cn

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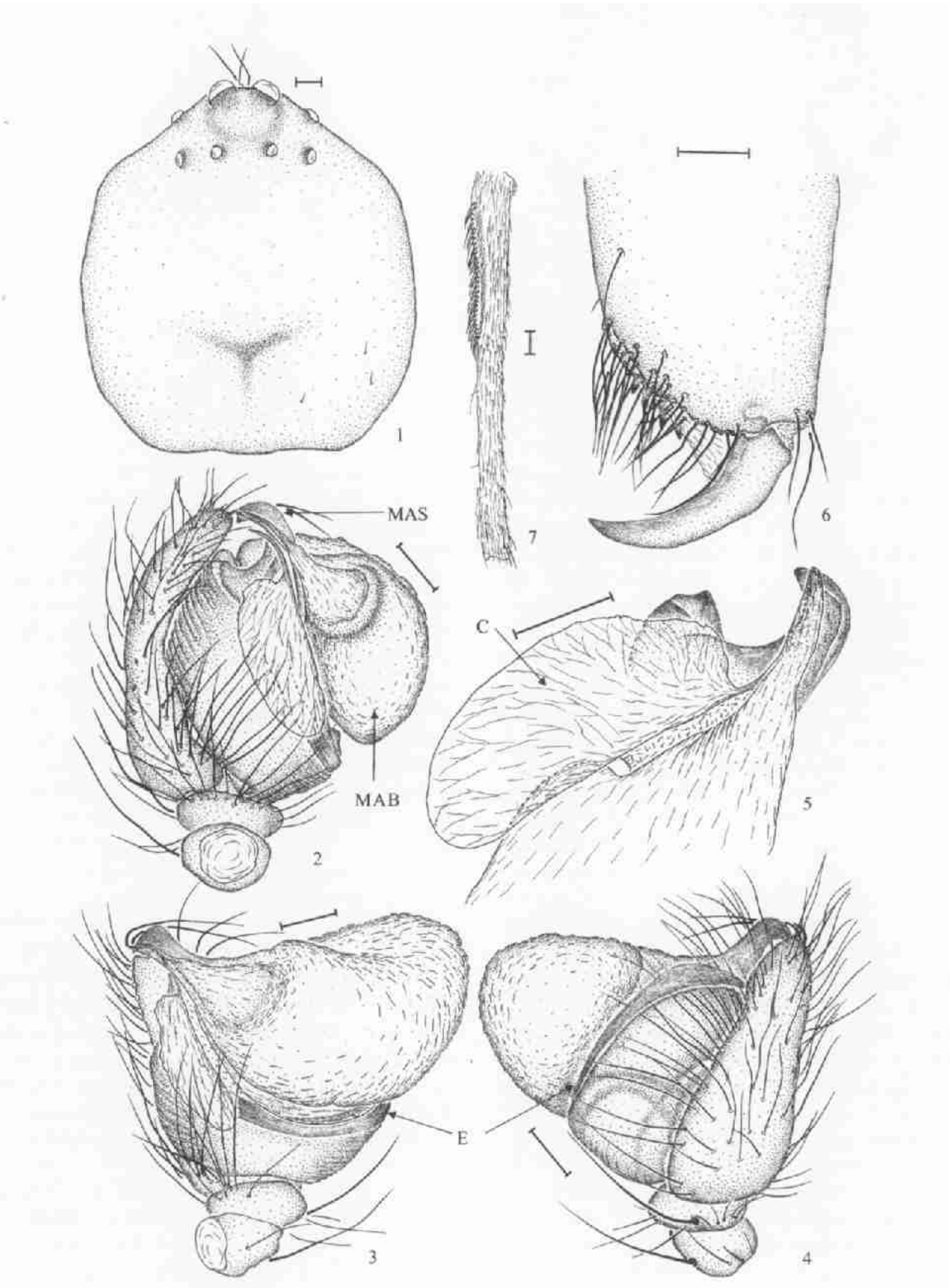
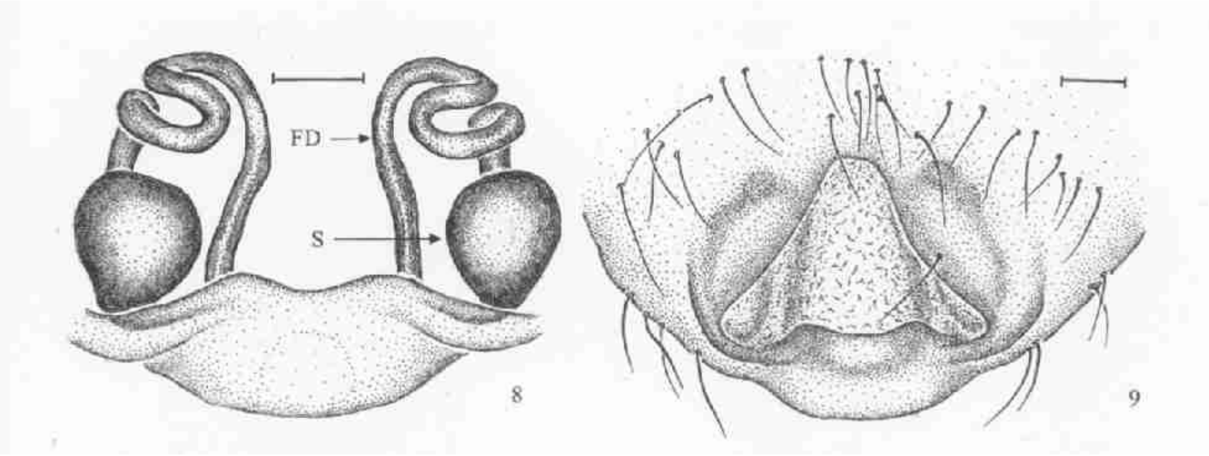
0.70 wide. Abdomen 2.75 long, 1.15 wide. Leg Ⅰ longest; leg formula: Ⅰ, Ⅳ, Ⅱ, Ⅲ. Leg measurements: Ⅰ: 8.90 (2.45+ 0.70+ 1.75+ 2.85+ 1.15); Ⅱ: 4.80 (1.40+ 0.45+ 0.90+ 1.30+ 0.75);



Figs 1-7. *Philoponella alata* sp. nov. 1. Male carapace, dorsal view. 2. Left male palp, prolateral view. 3. Same, ventral view. 4. Same, retrolateral view. 5. Male embolic division. 6. Male left chelicera, frontal view. 7. Female metatarsus Ⅳ. Scale bars= 0.1 mm.



Figs 8-9. *Philoponella alata* sp. nov., female paratype. 8. Vulva, dorsal view. 9. Epigynum, ventral view. Scale bar= 0.1 mm.

III: 3.80 (1.20+ 0.35+ 0.65+ 1.00+ 0.60); IV: 6.20 (1.65+ 0.55+ 1.40+ 1.60+ 1.00).

Carapace circular, with a transverse thoracic groove and a somewhat projecting region of AMEs. AME largest, separated from each other by 3/4 its diameter, from ALE by 1.2 times its diameter. Other eyes are approximately same size and widely separated by at least twice their diameter, with PME slightly smaller than PLE. Median ocular area foursquare (Fig. 1). Chlicerae longer than width, with 7 promarginal and 4 retromarginal teeth (Fig. 6). Femur I with one prolateral seta. Tibia I with 3 dorsal, 4 prolateral and 4 retrolateral setae. Metatarsus I with 14 dorsal and 4 retrolateral spines. Except for one dorsal seta, femur II has 15 retrolateral trichobothria in a row. Tibia II with 2 dorsal spines. Metatarsus II with 2 prolateral and 3 retrolateral setae. Femur III with 13 prolateral trichobothria in a row, one prolateral and one dorsal spine. Tibia III with 2 dorsal spines. Metatarsus III with 2 prolateral and 2 retrolateral spines. Femur IV bears 18 prolateral trichobothria, one prolateral and one dorsal spine. Tibia IV with 2 dorsal, 3 prolateral, one retrolateral and one ventral spines. Metatarsus IV with 4 prolateral, one retrolateral and 5 ventral spines. Palp orange, with basal lobe of conductor wing-shaped, similar to a dragonfly wing; its spike no longer than the apical part of MAS; MAS strongly bent as a rostriform tuber (Fig. 5).

Carapace pale bisque with grey hairs on the rim, without any color pattern. Chelicerae, maxillae and labium light yellow. Sternum pyriform, pale red. Legs gray yellow. Abdomen reddish yellow, with dusky modified spot at lateral stern.

Female. Total length 5.90. Carapace 1.90 long, 1.60 wide. Sternum 1.10 long, 0.70 wide. Abdomen 4.15 long, 1.50 wide. Female calamistra composed of 29 setae (Fig. 7). Leg I longest; leg formula: I, IV, II, III. Leg measurements: I: 10.85 (2.95+ 0.85+ 1.90+ 3.75+ 1.40); II: 6.20 (1.80+ 0.55+ 1.05+ 1.85+ 0.95); III: 4.85 (1.50+ 0.45+ 0.80+ 1.30+ 0.80); IV: 8.90 (2.65+ 0.75+ 1.95+ 2.20+ 1.35).

Carapace pyriform, with a trapeziform thoracic groove. Diameters of AME larger than the others. Region of AMEs appreciably projecting. Clypeus about equal to diameter of AME. PLEs diameters wider than that of ALE and PME. Chlicerae with 7 promarginal and 5 retromarginal teeth. Femur I with one dorsal spine. As male, tibia I with three dorsal, four prolateral and four retrolateral setae. Metatarsus I with 9 prolateral and 9 retrolateral spines. Except for one dorsal and one prolateral setae, femur II, has 19 retrolateral trichobothria in a row. Tibia II with 2 dorsal, one prolateral and one retrolateral spines. Metatarsus II with 3 dorsal, one retrolateral and one ventral setae. Femur III with 17 prolateral trichobothria in a row and one dorsal spine. Tibia III with 2 dorsal spines. Metatarsus III with 2 prolateral and one ventral spines. Femur IV bears 21 prolateral trichobothria, one prolateral spine. Tibia IV with 2 dorsal, 2 prolateral and 2 retrolateral spines. Metatarsus IV with 3 prolateral and 9 ventral spines. Tarsus IV bears 29 ventral spines. Epigynum as shown in Figs. 8-9: in ventral view, the dusky epigynum looks like a triangular pocket with its opening amazedly. The depth of ventrally epigynal crypt about equals to the size of crypt opening. In dorsal view, each long straight fertilization duct loops thrice before linking up an inverted pyriform spermatheca located at the anterior of the epigynum.

Carapace light yellow, with some grey hairs on the rim. Chelicerae, maxillae and labium reddish yellow. Sternum upended enneagon, yellow; sternum setae needle-like, long, black and thick. Legs grey black. Abdomen pale yellow, with three white pigments belts at backside. In the ventral, coloration becomes dusky grey.

Variation. The total body length ranges from 4.16 to 4.32 in males (n = 32) and from 5.82 to 5.90 in females ($n = 2$). The carapace ranges in length from 1.62 to 1.68 in males ($n = 32$) and from 1.88 to 1.90 in females ($n = 2$); in width from 1.38 to 1.43 in males ($n = 32$) and from 1.58 to 1.60 in females ($n = 2$).

Distribution. Only known from the type locality.

Natural history. *P. alata* sp. nov. is a common species in Xishuangbanna tropical rainforest, Yunnan Province, China. It can be found in moist shrubbery on the forest floor. According to the criteria of Avilés (1997), *P. alata* sp. nov. belongs to territorial permanent-social spider. Juveniles first appear in June. Spiderlings persist until early February. Like other *Philoponella* species, several orb-webs were built close together within the same dense tangle of attachment lines. All of the specimens described in this study were collected in a single web cluster.

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中国妩蛛科一种社会性蜘蛛初报及新种记述 (蜘蛛目, 妩蛛科)

林玉成[1,2] 李枢强[1*]

1. 中国科学院动物研究所 北京 100101

2. 中国科学院研究生院 北京 100049

摘 要 报道并描述了一种隶属于蛛形纲蜘蛛目妩蛛科的社会性蜘蛛: 翼状喜妩蛛 *Philoponella alata* sp. nov.。模式标本保存于中国科学院动物研究所。本种是中国第 1 次报道的社会性蜘蛛。

翼状喜妩蛛, 新种 Philoponella alata **sp. nov.** (图 1~ 9)

正模 ♂, 副模2♀♀, 32 ♂♂, 云南省西双版纳州勐腊县勐仑镇中国科学院西双版纳热带植物园, 2006 年 12 月 24 日, 李枢强采集。

新种与产自南美洲的条纹喜妩蛛 *P. vittata* (Keyserling, 1881) 相近, 两者的主要区别: 前者触肢引导器基片呈一完整的翼状, 后者窄长; 前者外雌器生殖孔为一近似等边三角形, 后者圆形; 前者受精管有 3 个弯结, 然后变端直, 后者则明显不同。

关键词 喜妩蛛属, 分类学, 社会性蜘蛛, 新种, 中国.

中图分类号 Q959.226

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* 通讯作者.